## CLAIMS

1. An apparatus for processing an information signal that converts a first information signal comprised of multiple items of information data into a second information signal comprised of multiple items of information data, the apparatus comprising:

class tap extraction means for extracting as a class tap multiple items of information data located in a periphery of a target position in the first information signal based on the first information signal;

class categorization means for obtaining a first class code by categorizing the class tap extracted by the class tap extraction means as any one of a plurality of classes based on the class tap;

dynamic range processing means for detecting a dynamic range which is a difference between a maximum value and a minimum value of the multiple items of information data contained in the class tap extracted by the class tap extraction means based on the class tap, to obtain area information that indicates which one of a plurality of sub-divided areas obtained by dividing a possible area of the dynamic range into plural ones the dynamic range belongs to;

class code conversion means for converting the first class code obtained by the class categorization means into one or a plurality of second class codes each corresponding to the first class code;

prediction tap extraction means for extracting as a prediction tap multiple items of information data located in

a periphery of the target position in the first information signal based on the first information signal;

first coefficient data generation means for generating first coefficient data, which is used in an estimate equation corresponding to the first class code obtained by the class categorization means;

second coefficient data generation means for generating second coefficient data, which is used in the estimate equation, corresponding to one or the plurality of second class codes, respectively, obtained through conversion by the class code conversion means;

first computation means for calculating information data based on the estimate equation, by using the first coefficient data generated by the first coefficient data generation means and the prediction tap extracted by the prediction tap extraction means;

second computation means for calculating information data based on the estimate equation, by using the second coefficient data generated by the second coefficient data generation means and the prediction tap extracted by the prediction tap extraction means; and

addition means for outputting the information data calculated by the first computation means as information data that constitutes the second information signal corresponding to a target position in the first information signal if the dynamic range belongs to one sub-divided area according to the area information obtained by the dynamic range processing means and, if the dynamic range belongs to another sub-divided area different from the one sub-divided area, outputting data obtained by performing addition mean on the information data

calculated by the first computation means and that calculated by the second computation means as the information data that constitutes the second information signal corresponding to the target position in the first information signal,

wherein the first coefficient data generated by the first coefficient data generation means and the second coefficient data generated by the second coefficient data generation means are based on a result of learning between a first learning signal that corresponds to the first information signal and a second learning signal that corresponds to the second information signal by use of such a portion of the dynamic range as to belong to the one sub-divided area; and

wherein the class code conversion means converts the first class code into the second class code in such a manner that the addition mean value of the information data calculated by the first computation means corresponding to the first class code and the information data calculated by the second computation means corresponding to the second class code may most approach a true value of the information data that constitutes the second information signal.

2. The apparatus for processing the information signal according to claim 1, wherein the dynamic range processing means obtains area information that indicates whether the dynamic range is less than a threshold value or not less than the threshold value.

3. The apparatus for processing the information signal according to claim 2, wherein if the dynamic range is not less

than the threshold value, the addition means outputs information data obtained by the first computation means as information data that constitutes the second information signal corresponding to a target position in the first information signal and, if the dynamic range is less than the threshold value, outputs data obtained by performing addition mean on information data obtained by the first computation means and that obtained by the second computation means as information data that constitutes the second information signal corresponding to the target position in the first information signal.

4. The apparatus for processing the information signal according to claim 1, wherein the first coefficient data generation means and the second coefficient data generation means each comprise:

storage means for storing coefficient data which is obtained beforehand and which is used in the estimate equation of each class; and

coefficient data reading means for reading coefficient data that corresponds to a class indicated by a class code from the storage means.

5. The apparatus for processing the information signal according to claim 1, wherein the first coefficient data generation means and the second coefficient data generation means each comprise:

storage means for storing coefficient seed data that is obtained beforehand for each class and is coefficient data in a production equation, which includes a predetermined

parameter, for producing coefficient data to be used in the estimate equation; and

coefficient data production means for producing coefficient data to be used in the estimate equation based on the production equation by using the coefficient seed data corresponding to a class indicated by a class code stored in the storage means.

6. The apparatus for processing the information signal according to claim 1, wherein the class code conversion means is configured by a lookup table in which a correspondence relationship between the first class code and the second class code is stored.

7. The apparatus for processing the information signal according to class 1, wherein the information signal is an image signal or an audio signal.

8. A method for processing an information signal that converts a first information signal comprised of multiple items of information data into a second information signal comprised of multiple items of information data, the method comprising:

a class tap extraction step of extracting as a class tap multiple items of information data located in a periphery of a target position in the first information signal based on the first information signal;

a class categorization step of obtaining a first class code by categorizing the class tap extracted by the class tap

extraction step as any one of a plurality of classes based on the class tap;

a dynamic range processing step of detecting a dynamic range which is a difference between a maximum value and a minimum value of the multiple items of information data contained in the class tap extracted by the class tap extraction step based on the class tap, to obtain area information that indicates which one of a plurality of sub-divided areas obtained by dividing a possible area of the dynamic range into plural ones the dynamic range belongs to;

a class code conversion step of converting a first class code obtained by the class categorization step into one or a plurality of second class codes each corresponding to the first class code;

a prediction tap extraction step of extracting as a prediction tap multiple items of information data located in a periphery of the target position in the first information signal based on the first information signal;

a first coefficient data generation step of generating first coefficient data, which is used in an estimate equation corresponding to the first class code obtained by the class categorization step;

a second coefficient data generation step of generating second coefficient data, which is used in the estimate equation, corresponding to one or the plurality of second class codes, respectively, obtained through conversion by the class code conversion step;

a first computation step of calculating information data based on the estimate equation, by using the first coefficient data generated by the first coefficient data

generation step and the prediction tap extracted by the prediction tap extraction step;

a second computation step of calculating information data based on the estimate equation, by using the second coefficient data generated by the second coefficient data generation step and the prediction tap extracted by the prediction tap extraction step; and

an addition step of outputting the information data calculated by the first computation step as information data that constitutes the second information signal corresponding to a target position in the first information signal if the dynamic range belongs to one sub-divided area according to the area information obtained by the dynamic range processing step and, if the dynamic range belongs to another sub-divided area different from the one sub-divided area, outputting data obtained by performing addition mean on the information data calculated by the first computation step and that calculated by the second computation step as the information data that constitutes the second information signal corresponding to the target position in the first information signal,

wherein the first coefficient data generated by the first coefficient data generation step and the second coefficient data generated by the second coefficient data generation step are based on a result of learning between a first learning signal that corresponds to the first information signal and a second learning signal that corresponds to the second information signal by use of such a portion of the dynamic range as to belong to the one sub-divided area; and

wherein in the class code conversion step, the first class code is converted into the second class code in such a manner that the addition mean value of the information data calculated by the first computation step corresponding to the first class code and the information data calculated by the second computation step corresponding to the second class code may most approach a true value of the information data that constitutes the second information signal.

9. A computer-readable medium recording a program for causing a computer to perform a method for processing an information signal, in order to convert a first information signal comprised of multiple items of information data into a second information signal comprised of multiple items of information data, the method comprising:

a class tap extraction step of extracting as a class tap multiple items of information data located in a periphery of a target position in the first information signal based on the first information signal;

a class categorization step of obtaining a first class code by categorizing the class tap extracted by the class tap extraction step as any one of a plurality of classes based on the class tap;

a dynamic range processing step of detecting a dynamic range which is a difference between a maximum value and a minimum value of the multiple items of information data contained in the class tap extracted by the class tap extraction step based on the class tap, to obtain area information that indicates which one of a plurality of

sub-divided areas obtained by dividing a possible area of the dynamic range into plural ones the dynamic range belongs to;

a class code conversion step of converting a first class code obtained by the class categorization step into one or a plurality of second class codes each corresponding to the first class code;

a prediction tap extraction step of extracting as a prediction tap multiple items of information data located in a periphery of the target position in the first information signal based on the first information signal;

a first coefficient data generation step of generating first coefficient data, which is used in an estimate equation corresponding to the first class code obtained by the class categorization step;

a second coefficient data generation step of generating second coefficient data, which is used in the estimate equation, corresponding to one or the plurality of second class codes, respectively, obtained through conversion by the class code conversion step;

a first computation step of calculating information data based on the estimate equation, by using the first coefficient data generated by the first coefficient data generation step and the prediction tap extracted by the prediction tap extraction step;

a second computation step of calculating information data based on the estimate equation, by using the second coefficient data generated by the second coefficient data generation step and the prediction tap extracted by the prediction tap extraction step; and

an addition step of outputting the information data calculated by the first computation step as information data that constitutes the second information signal corresponding to a target position in the first information signal if the dynamic range belongs to one sub-divided area according to the area information obtained by the dynamic range processing step and, if the dynamic range belongs to another sub-divided area different from the one sub-divided area, outputting data obtained by performing addition mean on the information data calculated by the first computation step and that calculated by the second computation step as the information data that constitutes the second information signal corresponding to the target position in the first information signal,

wherein the first coefficient data generated by the first coefficient data generation step and the second coefficient data generated by the second coefficient data generation step are based on a result of learning between a first learning signal that corresponds to the first information signal and a second learning signal that corresponds to the second information signal by use of such a portion of the dynamic range as to belong to the one sub-divided area; and

wherein in the class code conversion step, the first class code is converted into the second class code in such a manner that the addition mean value of the information data calculated by the first computation step corresponding to the first class code and the information data calculated by the second computation step corresponding to the second class code may most approach a true value of the information data that constitutes the second information signal.

10. A program for causing a computer to perform a method for processing an information signal, in order to convert a first information signal comprised of multiple items of information data into a second information signal comprised of multiple items of information data, the method comprising:

a class tap extraction step of extracting as a class tap multiple items of information data located in a periphery of a target position in the first information signal based on the first information signal;

a class categorization step of obtaining a first class code by categorizing the class tap extracted by the class tap extraction step as any one of a plurality of classes based on the class tap;

a dynamic range processing step of detecting a dynamic range which is a difference between a maximum value and a minimum value of the multiple items of information data contained in the class tap extracted by the class tap extraction step based on the class tap, to obtain area information that indicates which one of a plurality of sub-divided areas obtained by dividing a possible area of the dynamic range into plural ones the dynamic range belongs to;

a class code conversion step of converting a first class code obtained by the class categorization step into one or a plurality of second class codes each corresponding to the first class code;

a prediction tap extraction step of extracting as a prediction tap multiple items of information data located in a periphery of the target position in the first information signal based on the first information signal;

a first coefficient data generation step of generating first coefficient data, which is used in an estimate equation corresponding to the first class code obtained by the class categorization step;

a second coefficient data generation step of generating second coefficient data, which is used in the estimate equation, corresponding to one or the plurality of second class codes, respectively, obtained through conversion by the class code conversion step;

a first computation step of calculating information data based on the estimate equation, by using the first coefficient data generated by the first coefficient data generation step and the prediction tap extracted by the prediction tap extraction step;

a second computation step of calculating information data based on the estimate equation, by using the second coefficient data generated by the second coefficient data generation step and the prediction tap extracted by the prediction tap extraction step; and

an addition step of outputting the information data calculated by the first computation step as information data that constitutes the second information signal corresponding to a target position in the first information signal if the dynamic range belongs to one sub-divided area according to the area information obtained by the dynamic range processing step and, if the dynamic range belongs to another sub-divided area different from the one sub-divided area, outputting data obtained by performing addition mean on the information data calculated by the first computation step and that calculated by the second computation step as the information data that

constitutes the second information signal corresponding to the target position in the first information signal,

wherein the first coefficient data generated by the first coefficient data generation step and the second coefficient data generated by the second coefficient data generation step are based on a result of learning between a first learning signal that corresponds to the first information signal and a second learning signal that corresponds to the second information signal by use of such a portion of the dynamic range as to belong to the one sub-divided area; and

wherein in the class code conversion step, the first class code is converted into the second class code in such a manner that the addition mean value of the information data calculated by the first computation step corresponding to the first class code and the information data calculated by the second computation step corresponding to the second class code may most approach a true value of the information data that constitutes the second information signal.

11. An apparatus for processing an information signal that converts a first information signal comprised of multiple items of information data into a second information signal comprised of multiple items of information data, the apparatus comprising:

class tap extraction means for extracting as a class tap multiple items of information data located in a periphery of a target position in the first information signal based on the first information signal;

class categorization means for obtaining a class code by categorizing the class tap extracted by the class tap extraction means as any one of a plurality of classes based on the class tap;

dynamic range processing means for detecting a dynamic range, which is a difference between a maximum value and a minimum value of multiple items of information data contained in the class tap extracted by the class tap extraction means based on the class tap, to obtain area information that indicates which one of a plurality of sub-divided areas obtained by dividing a possible area of the dynamic range into plural ones the dynamic range belongs to;

prediction tap extraction means for extracting as a prediction tap multiple items of information data located in a periphery of the target position in the first information signal based on the first information signal;

coefficient data generation means for generating first coefficient data, which is used in an estimate equation corresponding to the class code, if the dynamic range belongs to one sub-divided area, according to the area information obtained by the dynamic range processing means and the class code obtained by the class categorization means and for generating second coefficient data, which is used in the estimate equation, if the dynamic range belongs to another sub-divided area different from the one sub-divided area; and

computation means for calculate information data that constitutes the second information signal corresponding to the target position in the first information signal based on the estimate equation using the first coefficient data or the second coefficient data generated by the coefficient data

generation means and the prediction tap extracted by the prediction tap extraction means,

wherein the first coefficient data generated by the first coefficient data generation means is based on a result of learning between a first learning signal that corresponds to the first information signal and a second learning signal that corresponds to the second information signal by use of such a portion of the dynamic range as to belong to the one sub-divided area; and

wherein the second coefficient data generated by the second coefficient data generation means is based on a result of learning, without the class categorization, between the first learning signal that corresponds to the first information signal and the second learning signal that corresponds to the second information signal.

12. The apparatus for processing the information signal according to claim 11, wherein the dynamic range processing means obtains area information that indicates whether the dynamic range is less than a threshold value or not less than the threshold value.

13. The apparatus for processing the information signal according to claim 11, wherein the coefficient data generation means comprises:

storage means for storing first coefficient data of each class, which is used in the estimate equation, and second coefficient data, which is used in the estimate equation, the first and second coefficient data being obtained beforehand; and

coefficient data reading means for reading the first coefficient data that corresponds to a class indicated by a class code from the storage means if the dynamic range belongs to the one sub-divided area and reading the second coefficient data from the storage means if the dynamic range belongs to another sub-divided area different from the one sub-divided area.

14. The apparatus for processing the information signal according to claim 11, wherein the coefficient data generation means comprises:

storage means for storing first coefficient seed data of each class, which is coefficient data in a production equation, which includes a predetermined parameter, for producing first coefficient data to be used in the estimate equation, and second coefficient seed data, which is coefficient data in the production equation for producing second coefficient data to be used in the estimate equation, the first coefficient seed data and the second coefficient seed data being obtained beforehand; and

coefficient data production means for producing first coefficient data, which is used in the estimate equation, based on the production equation, if the dynamic range belongs to the one sub-divided area, using the first coefficient seed data that corresponds to a class indicated by a class code stored in the storage means and, if the dynamic range belongs to another sub-divided area different from the on sub-divided area, for producing second coefficient data, which is used in the estimate equation, based on the production equation using the second coefficient seed data stored in the storage means.

15. The apparatus for processing the information signal according to claim 11, wherein the information signal is an image signal or an audio signal.

16. A method for processing an information signal that converts a first information signal comprised of multiple items of information data into a second information signal comprised of multiple items of information data, the method comprising:

a class tap extraction step of extracting as a class tap multiple items of information data located in a periphery of a target position in the first information signal based on the first information signal;

a class categorization step of obtaining a class code by categorizing the class tap extracted by the class tap extraction step as any one of a plurality of classes based on the class tap;

a dynamic range processing step of detecting a dynamic range, which is a difference between a maximum value and a minimum value of multiple items of information data contained in the class tap extracted by the class tap extraction step based on the class tap, to obtain area information that indicates which one of a plurality of sub-divided areas obtained by dividing a possible area of the dynamic range into plural ones the dynamic range belongs to;

a prediction tap extraction step of extracting as a prediction tap multiple items of information data located in a periphery of the target position in the first information signal based on the first information signal;

a coefficient data generation step of generating first coefficient data, which is used in an estimate equation corresponding to the class code, if the dynamic range belongs to one sub-divided area, according to the area information obtained by the dynamic range processing step and the class code obtained by the class categorization step and for generating second coefficient data, which is used in the estimate equation, if the dynamic range belongs to another sub-divided area different from the one sub-divided area; and

a computation step of calculating information data that constitutes the second information signal corresponding to the target position in the first information signal based on the estimate equation using the first coefficient data or the second coefficient data generated by the coefficient data generation step and the prediction tap extracted by the prediction tap extraction step,

wherein the first coefficient data generated by the first coefficient data generation step is based on a result of learning between a first learning signal that corresponds to the first information signal and a second learning signal that corresponds to the second information signal by use of such a portion of the dynamic range as to belong to the one sub-divided area; and

wherein the second coefficient data generated by the second coefficient data generation step is based on a result of learning, without the class categorization, between the first learning signal that corresponds to the first information signal and the second learning signal that corresponds to the second information signal.

17. A computer-readable medium recording a program for causing a computer to perform a method for processing an information signal, in order to convert a first information signal comprised of multiple items of information data into a second information signal comprised of multiple items of information data, the method comprising:

a class tap extraction step of extracting as a class tap multiple items of information data located in a periphery of a target position in the first information signal based on the first information signal;

a class categorization step of obtaining a class code by categorizing the class tap extracted by the class tap extraction step as any one of a plurality of classes based on the class tap;

a dynamic range processing step of detecting a dynamic range, which is a difference between a maximum value and a minimum value of multiple items of information data contained in the class tap extracted by the class tap extraction step based on the class tap, to obtain area information that indicates which one of a plurality of sub-divided areas obtained by dividing a possible area of the dynamic range into plural ones the dynamic range belongs to;

a prediction tap extraction step of extracting as a prediction tap multiple items of information data located in a periphery of the target position in the first information signal based on the first information signal;

a coefficient data generation step of generating first coefficient data, which is used in an estimate equation corresponding to the class code, if the dynamic range belongs to one sub-divided area, according to the area information

obtained by the dynamic range processing step and the class code obtained by the class categorization step and for generating second coefficient data, which is used in the estimate equation, if the dynamic range belongs to another sub-divided area different from the one sub-divided area; and

a computation step of calculating information data that constitutes the second information signal corresponding to the target position in the first information signal based on the estimate equation using the first coefficient data or the second coefficient data generated by the coefficient data generation step and the prediction tap extracted by the prediction tap extraction step,

wherein the first coefficient data generated by the first coefficient data generation step is based on a result of learning between a first learning signal that corresponds to the first information signal and a second learning signal that corresponds to the second information signal by use of such a portion of the dynamic range as to belong to the one sub-divided area; and

wherein the second coefficient data generated by the second coefficient data generation step is based on a result of learning, without the class categorization, between the first learning signal that corresponds to the first information signal and the second learning signal that corresponds to the second information signal.

18. A program for causing a computer to perform a method for processing an information signal, in order to convert a first information signal comprised of multiple items of

information data into a second information signal comprised of multiple items of information data, the method comprising:

a class tap extraction step of extracting as a class tap multiple items of information data located in a periphery of a target position in the first information signal based on the first information signal;

a class categorization step of obtaining a class code by categorizing the class tap extracted by the class tap extraction step as any one of a plurality of classes based on the class tap;

a dynamic range processing step of detecting a dynamic range, which is a difference between a maximum value and a minimum value of multiple items of information data contained in the class tap extracted by the class tap extraction step based on the class tap, to obtain area information that indicates which one of a plurality of sub-divided areas obtained by dividing a possible area of the dynamic range into plural ones the dynamic range belongs to;

a prediction tap extraction step of extracting as a prediction tap multiple items of information data located in a periphery of the target position in the first information signal based on the first information signal;

a coefficient data generation step of generating first coefficient data, which is used in an estimate equation corresponding to the class code, if the dynamic range belongs to one sub-divided area, according to the area information obtained by the dynamic range processing step and the class code obtained by the class categorization step and for generating second coefficient data, which is used in the

estimate equation, if the dynamic range belongs to another sub-divided area different from the one sub-divided area; and

a computation step of calculating information data that constitutes the second information signal corresponding to the target position in the first information signal based on the estimate equation using the first coefficient data or the second coefficient data generated by the coefficient data generation step and the prediction tap extracted by the prediction tap extraction step,

wherein the first coefficient data generated by the first coefficient data generation step is based on a result of learning between a first learning signal that corresponds to the first information signal and a second learning signal that corresponds to the second information signal by use of such a portion of the dynamic range as to belong to the one sub-divided area; and

wherein the second coefficient data generated by the second coefficient data generation step is based on a result of learning, without the class categorization, between the first learning signal that corresponds to the first information signal and the second learning signal that corresponds to the second information signal.

19. An apparatus for producing coefficient that produces coefficient data, which is used in an estimate equation to be used when converting a first information signal comprised of multiple items of information data into a second information signal comprised of multiple items of information data or coefficient seed data, which is coefficient data in

a production equation for producing the former coefficient data, the apparatus comprising:

class tap extraction means for extracting as a class tap multiple items of information data located in a periphery of a target position in a first learning signal that corresponds to the first information signal based on the first learning signal;

class categorization means for obtaining a class code by categorizing the class tap extracted by the class tap extraction means as any one of a plurality of classes based on the class tap;

dynamic range processing means for detecting a dynamic range, which is a difference between a maximum value and a minimum value of multiple items of information data contained in the class tap extracted by the class tap extraction means based on the class tap, to obtain area information that indicates which one of a plurality of sub-divided areas obtained by dividing a possible area of the dynamic range into plural ones the dynamic range belongs to;

prediction tap extraction means for extracting as a prediction tap multiple items of information data located in a periphery of the target position in the first learning signal based on the first learning signal if the dynamic range belongs to one sub-divided area according to the area information obtained by the dynamic range processing means;

teacher data extraction means for extracting, as teacher data, information data that corresponds to the target position in the first learning signal based on a second learning signal that corresponds to the second information signal if the dynamic range belongs to the one sub-divided area

according to the area information obtained by the dynamic range processing means; and

computation means for obtaining the coefficient data of each class or the coefficient seed data of each class by using the class code obtained by the class categorization means, the prediction tap extracted by the prediction tap extraction means, and the teacher data extracted by the teacher data extraction means.

20. A method for producing coefficient that produces coefficient data, which is used in an estimate equation to be used when converting a first information signal comprised of multiple items of information data into a second information signal comprised of multiple items of information data or coefficient seed data, which is coefficient data in a production equation for producing the former coefficient data, the method comprising:

a class tap extraction step of extracting as a class tap multiple items of information data located in a periphery of a target position in a first learning signal that corresponds to the first information signal based on the first learning signal;

a class code categorization step of obtaining a class code by categorizing the class tap extracted by the class tap extraction step as any one of a plurality of classes based on the class tap;

a dynamic range processing step of detecting a dynamic range, which is a difference between a maximum value and a minimum value of multiple items of information data contained in the class tap extracted by the class tap extraction step

based on the class tap, to obtain area information that indicates which one of a plurality of sub-divided areas obtained by dividing a possible area of the dynamic range into plural ones the dynamic range belongs to;

a prediction tap extraction step of extracting as a prediction tap multiple items of information data located in a periphery of the target position in the first learning signal based on the first learning signal if the dynamic range belongs to one sub-divided area according to the area information obtained by the dynamic range processing step;

a teacher data extraction step of extracting, as teacher data, information data that corresponds to the target position in the first learning signal based on a second learning signal that corresponds to the second information signal if the dynamic range belongs to the one sub-divided area according to the area information obtained by the dynamic range processing step; and

a computation step of obtaining the coefficient data of each class or the coefficient seed data of each class by using the class code obtained by the class categorization step, the prediction tap extracted by the prediction tap extraction step, and the teacher data extracted by the teacher data extraction step.

21. A computer-readable medium recording a program for causing a computer to perform a method for producing coefficient, in order to produce coefficient data, which is used in an estimate equation to be used when converting a first information signal comprised of multiple items of information data into a second information signal comprised of multiple

items of information data or coefficient seed data, which is coefficient data in a production equation for producing the former coefficient data, the method comprising:

a class tap extraction step of extracting as a class tap multiple items of information data located in a periphery of a target position in a first learning signal that corresponds to the first information signal based on the first learning signal;

a class code categorization step of obtaining a class code by categorizing the class tap extracted by the class tap extraction step as any one of a plurality of classes based on the class tap;

a dynamic range processing step of detecting a dynamic range, which is a difference between a maximum value and a minimum value of multiple items of information data contained in the class tap extracted by the class tap extraction step based on the class tap, to obtain area information that indicates which one of a plurality of sub-divided areas obtained by dividing a possible area of the dynamic range into plural ones the dynamic range belongs to;

a prediction tap extraction step of extracting as a prediction tap multiple items of information data located in a periphery of the target position in the first learning signal based on the first learning signal if the dynamic range belongs to one sub-divided area according to the area information obtained by the dynamic range processing step;

a teacher data extraction step of extracting, as teacher data, information data that corresponds to the target position in the first learning signal based on a second learning signal that corresponds to the second information

signal if the dynamic range belongs to the one sub-divided area according to the area information obtained by the dynamic range processing step; and

a computation step of obtaining the coefficient data of each class or the coefficient seed data of each class by using the class code obtained by the class categorization step, the prediction tap extracted by the prediction tap extraction step, and the teacher data extracted by the teacher data extraction step.

22. A program for causing a computer to perform a method for producing coefficient, in order to produce coefficient data, which is used in an estimate equation to be used when converting a first information signal comprised of multiple items of information data into a second information signal comprised of multiple items of information data or coefficient seed data, which is coefficient data in a production equation for producing the former coefficient data, the method comprising:

a class tap extraction step of extracting as a class tap multiple items of information data located in a periphery of a target position in a first learning signal that corresponds to the first information signal based on the first learning signal;

a class code categorization step of obtaining a class code by categorizing the class tap extracted by the class tap extraction step as any one of a plurality of classes based on the class tap;

a dynamic range processing step of detecting a dynamic range, which is a difference between a maximum value and a

minimum value of multiple items of information data contained in the class tap extracted by the class tap extraction step based on the class tap, to obtain area information that indicates which one of a plurality of sub-divided areas obtained by dividing a possible area of the dynamic range into plural ones the dynamic range belongs to;

a prediction tap extraction step of extracting as a prediction tap multiple items of information data located in a periphery of the target position in the first learning signal based on the first learning signal if the dynamic range belongs to one sub-divided area according to the area information obtained by the dynamic range processing step;

a teacher data extraction step of extracting, as teacher data, information data that corresponds to the target position in the first learning signal based on a second learning signal that corresponds to the second information signal if the dynamic range belongs to the one sub-divided area according to the area information obtained by the dynamic range processing step; and

a computation step of obtaining the coefficient data of each class or the coefficient seed data of each class by using the class code obtained by the class categorization step, the prediction tap extracted by the prediction tap extraction step, and the teacher data extracted by the teacher data extraction step.

23. An apparatus for producing a lookup table that produces a correspondence relationship between a first class code and a second class code, which are used when converting a first information signal comprised of multiple items of

information data into a second information signal comprised of multiple items of information data, the apparatus comprising:

class tap extraction means for extracting as a class tap multiple items of information data located in a periphery of a target position in a first learning signal that corresponds to the first information signal based on the first learning signal;

class categorization means for obtaining a class code by categorizing the class tap extracted by the class tap extraction means as any class of a plurality of class taps based on the class tap;

dynamic range processing means for detecting a dynamic range which is a difference between a maximum value and a minimum value of multiple items of information data contained in the class tap extracted by the class tap extraction means based on the class tap, to obtain area information that indicates which one of a plurality of sub-divided areas obtained by dividing a possible area of the dynamic range into plural ones the dynamic range belongs to;

prediction tap extraction means for extracting as a prediction tap multiple items of information data located in a periphery of the target position in the first learning signal based on the first learning signal;

first coefficient data generation means for generating coefficient data, which is used in an estimate equation at a class that corresponds to a class code obtained by the class categorization means;

predictive computation means for calculating information data that corresponds to a target position in the

first learning signal based on the estimate equation using the coefficient data generated by the first coefficient data generation means and the prediction tap extracted by the prediction tap extraction means;

second coefficient data generation means for generating coefficient data, which is used in an estimate equation at the plurality of classes;

all-the-class predictive computation means for calculating information data that corresponds to a target position in the first learning signal for each of the classes based on the estimate equation using coefficient data of each class generated by the second coefficient data generation means and a prediction tap extracted by the prediction tap extraction means;

teacher data extraction means for extracting, as teacher data, information data that corresponds to a target position in the first learning signal based on a second learning signal that corresponds to the second information signal;

error calculation means for calculating an error of the information data obtained by the predictive computation means with respect to the teacher data extracted by the teacher data extraction means;

all-the-class error calculation means for calculating an error of information data of each of the classes obtained by the all-the-class predictive computation means with respect to the teacher data extracted by the teacher data extraction means;

error addition means for adding an error obtained by the error calculation means to an error of each of the classes

obtained by the all-the-class calculation means to obtain an error sum of the classes;

error sum accumulation means for adding a value that corresponds to a magnitude of the error sum of each of the classes obtained by the error addition means to an accumulated value of each output class at an input class that corresponds to the class code obtained by the class categorization means if the dynamic range belongs to another sub-divided area different from that one sub-divided area according to the area information obtained by the dynamic range processing means; and

table production means for allocating an output class in which an accumulated value of each output class to each of the input classes, the accumulated value being obtained by the error sum accumulation means, is minimized based on the accumulated value at each of the input classes, to produce a correspondence relationship between the first class code that corresponds to the input class and the second class code that corresponds to the output class,

wherein items of the coefficient data generated by the first coefficient data generation means and generated by the second coefficient data generation means are based on a result of learning between a first learning signal that corresponds to the first information signal and a second learning signal that corresponds to the second information signal by use of only such a portion of the dynamic range as to belong to the one sub-divided area.

24. A method for producing a lookup table that produces a correspondence relationship between a first class code and

a second class code, which are used when converting a first information signal comprised of multiple items of information data into a second information signal comprised of multiple items of information data, the method comprising:

a class tap extraction step of extracting as a class tap multiple items of information data located in a periphery of a target position in a first learning signal that corresponds to the first information signal based on the first learning signal;

a class categorization step of obtaining a class code by categorizing the class tap extracted by the class tap extraction step as any class of a plurality of class taps based on the class tap;

a dynamic range processing step of detecting a dynamic range which is a difference between a maximum value and a minimum value of multiple items of information data contained in the class tap extracted by the class tap extraction step based on the class tap, to obtain area information that indicates which one of a plurality of sub-divided areas obtained by dividing a possible area of the dynamic range into plural ones the dynamic range belongs to;

a prediction tap extraction step of extracting as a prediction tap multiple items of information data located in a periphery of the target position in the first learning signal based on the first learning signal;

a first coefficient data generation step of generating coefficient data, which is used in an estimate equation at a class that corresponds to a class code obtained by the class categorization step;

a predictive computation step of calculating information data that corresponds to a target position in the first learning signal based on the estimate equation using coefficient data generated by the first coefficient data generation step and the prediction tap extracted by the prediction tap extraction step;

a second coefficient data generation step of generating coefficient data, which is used in an estimate equation at the plurality of classes;

an all-the-class predictive computation step of calculating information data that corresponds to a target position in the first learning signal for each of the classes based on the estimate equation using coefficient data of each class generated by the second coefficient data generation step and a prediction tap extracted by the prediction tap extraction step;

a teacher data extraction step of extracting, as teacher data, information data that corresponds to a target position in the first learning signal based on a second learning signal that corresponds to the second information signal;

an error calculation step of calculating an error of the information data obtained by the predictive computation step with respect to the teacher data extracted by the teacher data extraction step;

an all-the-class error calculation step of calculating an error of information data of each of the classes obtained by the all-the-class predictive computation step with respect to teacher data extracted by the teacher data extraction step;

an error addition step of adding an error obtained by the error calculation step to an error of each of the classes obtained by the all-the-class calculation step to obtain an error sum of the classes;

an error sum accumulation step of adding a value that corresponds to a magnitude of an error sum of each of the classes obtained by the error addition step to an accumulated value of each output class at an input class that corresponds to the class code obtained by the class categorization step if the dynamic range belongs to another sub-divided area different from that one sub-divided area according to the area information obtained by the dynamic range processing step; and

a table production step of allocating an output class in which an accumulated value of each output class to each of the input classes, the accumulated value being obtained by the error sum accumulation step, is minimized based on the accumulated value at each of the input classes, to produce a correspondence relationship between the first class code that corresponds to the input class and the second class code that corresponds to the output class,

wherein items of the coefficient data generated by the first coefficient data generation step and generated by the second coefficient data generation step are based on a result of learning between a first learning signal that corresponds to the first information signal and a second learning signal that corresponds to the second information signal by use of only such a portion of the dynamic range as to belong to the one sub-divided area.

25. A computer-readable medium recording a program for causing a computer to perform a method for producing a lookup table, in order to produce a correspondence relationship between a first class code and a second class code, which are used when converting a first information signal comprised of multiple items of information data into a second information signal comprised of multiple items of information data, the method comprising:

a class tap extraction step of extracting as a class tap multiple items of information data located in a periphery of a target position in a first learning signal that corresponds to the first information signal based on the first learning signal;

a class categorization step of obtaining a class code by categorizing the class tap extracted by the class tap extraction step as any class of a plurality of class taps based on the class tap;

a dynamic range processing step of detecting a dynamic range which is a difference between a maximum value and a minimum value of multiple items of information data contained in the class tap extracted by the class tap extraction step based on the class tap, to obtain area information that indicates which one of a plurality of sub-divided areas obtained by dividing a possible area of the dynamic range into plural ones the dynamic range belongs to;

a prediction tap extraction step of extracting as a prediction tap multiple items of information data located in a periphery of the target position in the first learning signal based on the first learning signal;

a first coefficient data generation step of generating coefficient data, which is used in an estimate equation at a class that corresponds to a class code obtained by the class categorization step;

a predictive computation step of calculating information data that corresponds to a target position in the first learning signal based on the estimate equation using coefficient data generated by the first coefficient data generation step and the prediction tap extracted by the prediction tap extraction step;

a second coefficient data generation step of generating coefficient data, which is used in an estimate equation at the plurality of classes;

an all-the-class predictive computation step of calculating information data that corresponds to a target position in the first learning signal for each of the classes based on the estimate equation using coefficient data of each class generated by the second coefficient data generation step and a prediction tap extracted by the prediction tap extraction step;

a teacher data extraction step of extracting, as teacher data, information data that corresponds to a target position in the first learning signal based on a second learning signal that corresponds to the second information signal;

an error calculation step of calculating an error of the information data obtained by the predictive computation step with respect to the teacher data extracted by the teacher data extraction step;

an all-the-class error calculation step of calculating an error of information data of each of the classes obtained by the all-the-class predictive computation step with respect to teacher data extracted by the teacher data extraction step;

an error addition step of adding an error obtained by the error calculation step to an error of each of the classes obtained by the all-the-class calculation step to obtain an error sum of the classes;

an error sum accumulation step of adding a value that corresponds to a magnitude of an error sum of each of the classes obtained by the error addition step to an accumulated value of each output class at an input class that corresponds to the class code obtained by the class categorization step if the dynamic range belongs to another sub-divided area different from that one sub-divided area according to the area information obtained by the dynamic range processing step; and

a table production step of allocating an output class in which an accumulated value of each output class to each of the input classes, the accumulated value being obtained by the error sum accumulation step, is minimized based on the accumulated value at each of the input classes, to produce a correspondence relationship between the first class code that corresponds to the input class and the second class code that corresponds to the output class,

wherein items of the coefficient data generated by the first coefficient data generation step and generated by the second coefficient data generation step are based on a result of learning between a first learning signal that corresponds to the first information signal and a second learning signal that corresponds to the second information signal by use of

only such a portion of the dynamic range as to belong to the one sub-divided area.

26. A program for causing a computer to perform a method for producing a lookup table, in order to produce a correspondence relationship between a first class code and a second class code, which are used when converting a first information signal comprised of multiple items of information data into a second information signal comprised of multiple items of information data, the method comprising:

a class tap extraction step of extracting as a class tap multiple items of information data located in a periphery of a target position in a first learning signal that corresponds to the first information signal based on the first learning signal;

a class categorization step of obtaining a class code by categorizing the class tap extracted by the class tap extraction step as any class of a plurality of class taps based on the class tap;

a dynamic range processing step of detecting a dynamic range which is a difference between a maximum value and a minimum value of multiple items of information data contained in the class tap extracted by the class tap extraction step based on the class tap, to obtain area information that indicates which one of a plurality of sub-divided areas obtained by dividing a possible area of the dynamic range into plural ones the dynamic range belongs to;

a prediction tap extraction step of extracting as a prediction tap multiple items of information data located in

a periphery of the target position in the first learning signal based on the first learning signal;

a first coefficient data generation step of generating coefficient data, which is used in an estimate equation at a class that corresponds to a class code obtained by the class categorization step;

a predictive computation step of calculating information data that corresponds to a target position in the first learning signal based on the estimate equation using coefficient data generated by the first coefficient data generation step and the prediction tap extracted by the prediction tap extraction step;

a second coefficient data generation step of generating coefficient data, which is used in an estimate equation at the plurality of classes;

an all-the-class predictive computation step of calculating information data that corresponds to a target position in the first learning signal for each of the classes based on the estimate equation using coefficient data of each class generated by the second coefficient data generation step and a prediction tap extracted by the prediction tap extraction step;

a teacher data extraction step of extracting, as teacher data, information data that corresponds to a target position in the first learning signal based on a second learning signal that corresponds to the second information signal;

an error calculation step of calculating an error of the information data obtained by the predictive computation step

with respect to the teacher data extracted by the teacher data extraction step;

an all-the-class error calculation step of calculating an error of information data of each of the classes obtained by the all-the-class predictive computation step with respect to teacher data extracted by the teacher data extraction step;

an error addition step of adding an error obtained by the error calculation step to an error of each of the classes obtained by the all-the-class calculation step to obtain an error sum of the classes;

an error sum accumulation step of adding a value that corresponds to a magnitude of an error sum of each of the classes obtained by the error addition step to an accumulated value of each output class at an input class that corresponds to the class code obtained by the class categorization step if the dynamic range belongs to another sub-divided area different from that one sub-divided area according to the area information obtained by the dynamic range processing step; and

a table production step of allocating an output class in which an accumulated value of each output class to each of the input classes, the accumulated value being obtained by the error sum accumulation step, is minimized based on the accumulated value at each of the input classes, to produce a correspondence relationship between the first class code that corresponds to the input class and the second class code that corresponds to the output class,

wherein items of the coefficient data generated by the first coefficient data generation step and generated by the second coefficient data generation step are based on a result of learning between a first learning signal that corresponds

to the first information signal and a second learning signal that corresponds to the second information signal by use of only such a portion of the dynamic range as to belong to the one sub-divided area.